

# 51 mm (2.0") photomultiplier L51B20 series data sheet



## 1 description

The L51B20 is a 51mm (2") diameter, end window photomultiplier with a blue-green sensitive photocathode and 10 high stability, SbCs linear focused dynodes. It is electrically and mechanically interchangeable with the ADIT B51D01 but without the need for a separate focus connection.

The short base version (L51B20S) is a plug-in alternative to many other 10 stage photomultiplier having a 14 pin capped base. A flexible wire version is available (L51B20W) and this can also be supplied fitted with a voltage divider to a configuration agreed upon with the customer.

## 2 applications

- scintillation counting
- general purpose low light level detection

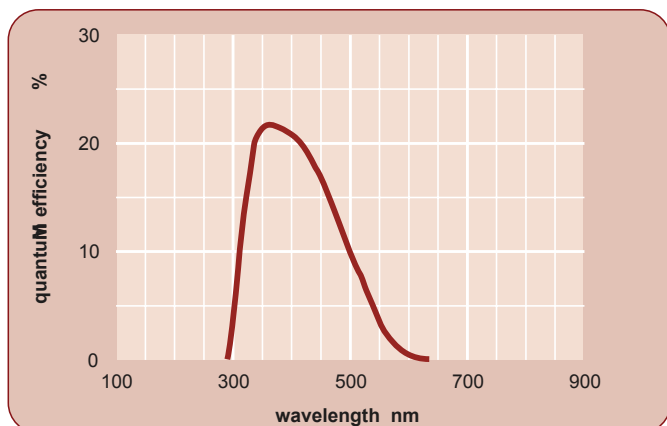
## 3 features

- low dark current
- good energy resolution
- high pulse linearity
- low rate effect
- helium resistant envelope

## 4 window characteristics

L51B20 soda lime	
spectral range*(nm)	290 - 620
refractive index (n <sub>e</sub> )	1.52
K (ppm)	50,000
Th (ppb)	250
U (ppb)	200

## 5 typical spectral response curves

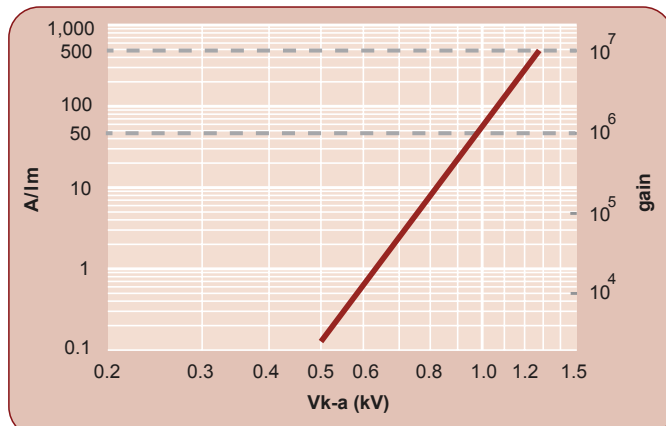


## 6 characteristics

	unit	min	typ	max
<b>photocathode: bialkali</b>				
active diameter	mm		48	
quantum efficiency at peak	%	22		
luminous sensitivity	$\mu\text{A/lm}$		50	
with CB filter		5	9	
with CR filter			0.5	
<b>dynodes: 10LF</b>				
<b>anode sensitivity:</b>				
nominal anode sensitivity	A/lm		50	
max. rated anode sensitivity	A/lm		500	
overall V for nominal A/lm	V	800	950	1200
overall V for max. rated A/lm	V		1250	
gain at nominal A/lm	$\times 10^6$		1.0	
<b>dark current at 20°C:</b>				
dc at nominal A/lm	nA		0.3	1.5
dc at max. rated A/lm	nA		3	
dark count rate	$\text{s}^{-1}$		-	
<b>pulsed linearity(-5% deviation)</b>	mA		20	
<b>rate effect(I for <math>\Delta g/g+1\%</math>):</b>	$\mu\text{A}$		20	
<b>magnetic field sensitivity:</b>				
the field for which the output decreases by 50%				
most sensitive direction	$\text{T} \times 10^4$		1.3	
<b>temperature coefficient:</b>	% C		$\pm 0.5$	
<b>timing:</b>				
multi electron rise time	ns		4	
multi electron (fwhm)	ns		6.5	
transit time	ns		40	
<b>weight:</b>	g		94	
<b>maximum ratings:</b>				
anode current	$\mu\text{A}$			100
cathode current	nA			100
gain	$\times 10^6$		10	
anode sensitivity	A/lm		500	
temperature	$^{\circ}\text{C}$	-30		60
V (k-a) <sup>(1)</sup>	V			2000
V (k-d1)	V			300
V (d-d) <sup>(2)</sup>	V			300
ambient pressure (absolute)	kPa			101

(1) subject to not exceeding max. rated sensitivity (2) subject to not exceeding max. rated V(k-a)

## 7 typical voltage gain characteristics



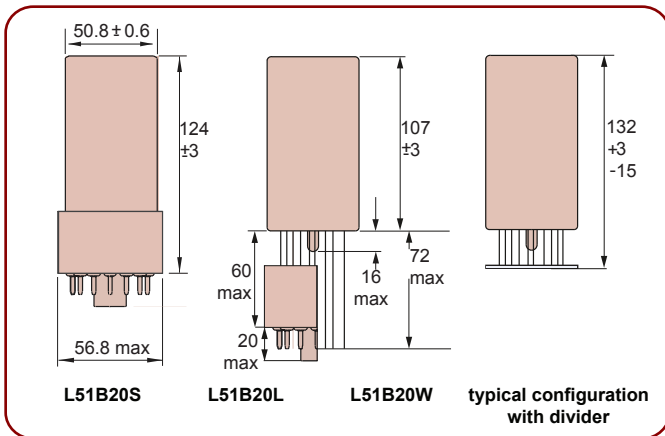
## 8 voltage divider distribution

k	d <sub>1</sub>	d <sub>2</sub>	.....	d <sub>7</sub>	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	a
2R	R	.....	R	R	R	R	R	Standard

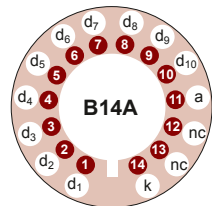
Characteristics contained in this data sheet refer to standard divider.

## 9 external dimensions mm

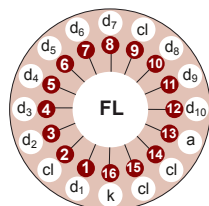
The drawing below show the L51B20S and L51B20L with the B14A cap fitted, the L51B20W in flying lead format and the L51B20W with a factory fitted voltage divider.



## 10 base configuration (viewed from below)



B14A cap for L51B20S and L51B20L  
'nc' indicates no internal connection



flying lead base for L51B20W  
'cl' indicates cut lead

A range of B14A sockets are available to suit the B14A cap of the L51B20S and L51B20L. The socket range includes versions with or without a mounting flange, and with contacts for mounting directly onto printed circuit boards.

The L51B20 can be supplied with a custom designed voltage divider installed.

## 11 ordering information

The L51B20 meets the specifications given in this data sheet. The desired basing option must be specified when ordering by appending the W,S or L suffix to the part number. Custom specifications are available.

Product with special test requirements, integral voltage divider network or with one or more of the shielding options below will be assigned a suffix with the letter A followed by a unique 3 digit number to designate the requirement.

**L51B20**

**base options**

- W** flying leads, no cap
- S** capped
- L** temporary B14 cap

**L51B20**

**specification options**

- A nnn** special requirements unique designator

52.3 max with electrostatic shielding

53.1 max with electromagnetic shielding

conductive coating

electromagnetic shielding

insulating sleeve

These options are available by special order with any of the base options above.

## 12 voltage dividers

The standard voltage dividers available for these pmts are tabulated below:

L51B20S	k	d	d <sub>1</sub>	.....	d <sub>6</sub>	d <sub>7</sub>	d <sub>8</sub>	d <sub>9</sub>	d <sub>10</sub>	a
L51B20L	C636A	2R	R	.....	R	R	R	R	R	Standard

R=330 kΩ

Custom dividers available for all base options.

**ADIT Electron Tubes**  
300 Crane Street  
Sweetwater, Texas 79556 U.S.A.  
tel:(325)235-1418  
toll free:(800)399-4557  
fax:(325)235-2872  
email:sales@electrontubes.com  
website:www.electrontubes.com

**ET Enterprises Limited**  
45 Riverside Way  
Uxbridge UB8 2YF  
United Kingdom  
tel:+44(0)1895 2000880  
fax:+44(0)1895 270273  
email:sales@et-enterprises.com  
website:www.et-enterprises.com

choose accessories for this pmt on our website

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